DOCUMENT RESUME

ED 455 678 EF 005 979

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TITLE	Sustainable Schools, Sustainable Communities: The View from the West. CAE Spring 2001 Conference [Proceedings] (San Diego, California, March 22-24, 2001).
INSTITUTION	American Inst. of Architects, Washington, DC.
PUB DATE	2001-03-00
NOTE	11p.; Conference sponsored by the American Institute of Architect's Committee on Architecture for Education, (CAE). Photographs may not reproduce well.
AVAILABLE FROM	For full text: http://www.aia.org/pia/cae/Default.asp.
PUB TYPE	Collected Works - Proceedings (021)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Conferences; Educational Facilities Design; Elementary Secondary Education; Public Schools; *School Community Relationship; *Sustainable Development

ABSTRACT

This paper presents summary conclusions reached by discussion panels that participated in the Committee on Architecture for Education's conference. The conference explored the symbiotic relationship between schools and communities and the ways that schools and communities sustain one another. Panel titles were: "City Heights Urban Village"; "High Tech High"; "Educational Center"; "Symbols, Forms, Materials, and Regional Aesthetics: The Sustainability of Culture and the Search for Authenticity"; "Ecology, Landscape Design, and Conservation: Working with Building Systems to Generate Meaningful Spaces for Learning"; "Campus Planning and Community Design: The Impact on Our Quality of Life"; and "The Next Generation: Satellite Learning Centers, Global Teleconferencing Labs, and Public-Private Partnerships." (GR)

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CAE Spring 2001 Conference

Sustainable Schools, Sustainable Communities: The View from the West

Sara Malone, editor/writer

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Overview

"Sustainable Schools, Sustainable Communities" explored the symbiotic relationship between schools and communities and how they sustain one another. The Committee on Architecture for Education sponsored this conference in San Diego, March 22-24, 2001.

There are many ways that a school can be sustainable, and there are many varieties of sustainability, whether of a culture, a community, or the environment.

Schools are a critical element in the mosaic of community redevelopment. For example, The City Heights Urban Village project is a 37.6-acre-acre redevelopment of an inner city neighborhood that includes an elementary school, community college center, and public library, among other things.

Schools can also celebrate a community's heritage and culture. A tour of Chavez Elementary School in San Diego demonstrated how elements of cultural history—in this case the ancient American cultures—add depth to a facility. The depiction of a Mayan deity on the main façade of the campus is a proud statement for a Hispanic community.

Sometimes the school is the heart of the community. At the Tenderloin School in San Francisco, meeting spaces, a community kitchen, and health services are offered in addition to classes. Other schools forge close bonds with the business community, such as Alpha High School in Portland. The school trains students through specialized courses and hands-on opportunities at local businesses.

Environmental sustainability in school design was also addressed at the conference. Walker Elementary in McKinney, Texas, and the Henry Ford Museum School in Dearborn, Mich. are good examples of recycled materials use and energy efficient features. In addition to being environmentally friendly, these elements are also used to instruct students in various science, math, and environmental problems and issues.

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City Heights Urban Village

Panel: William Jones, president and CEO, CityLink Investment Corp.
Augustine Gallegos, chancellor, San Diego Community College District
Deb Ferrin, City of San Diego Child Care coordinator
Marcia McLatchy, City of San Diego Park and Recreation director
Michael Sprague, community participation
Anthony Cutri, AIA, architect planner

In 1994, CityLink Investment Corp. President Williams Jones approached Martinez + Cutri Corporation and asked them to help redesign San Diego's City Heights neighborhood, an inner city area that was falling apart.

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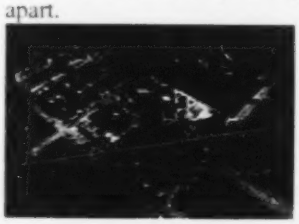

City Heights Plan
Image provided by Martinez + Cutri

Many people involved in the project pooled their time and talents to build a viable community. Education was important to the effort. Rosa Parks Elementary School, the Head Start Program, and a community college are cornerstones in turning City Heights into a sustainable community, agreed Deb Ferrin and Anthony Cutri.
But it was the partnerships that have kept the project going. "You don't

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succeed without partners," Marcia McLatchy said.

"Our focus was to create a soul, a connection between citizens and government and the business community," William Jones said. When he chose the neighborhood as the site of the redevelopment project, even public infrastructure was lacking.

Spending on infrastructure led to retail commitment. The San Diego City government spent money on a police station and a recreation center. Among other things, the city wanted to prove its commitment to the project. Now a shopping center is going in, and it is already 98 percent leased.

The new police station brought greater safety and peace of mind. With over 200 cops based in the community, there has been a significant drop in the crime rate.

Project funding has been complex, involving public and private money, purchases and long-term leases and grants.

High Tech High

Larry Rosenstock, CEO and President of High Tech High

High Tech High (www.hightechhigh.org) was a positive product of dedicated self-interest, said Larry Rosenstock. Local companies were desperate for employees due to significant business and less than two percent unemployment, so they banded together and formed their own school.

San Diego Unified transferred power to San Diego State University for the charter school, which received money from the Bill and Melinda Gates Foundation.

In 1999, the school had no physical presence. The design team looked at high schools across the country searching for ideas. Although they did not want to adopt a single model, they were most impressed—and most influenced by—the Zoo School in Minneapolis.

The 40,000-square-foot-structure cost just 42 percent what an average school renovation would cost, and it is operated at the same cost as San Diego Unified schools.

There were three main design concepts:

1. **Personalization**—the school has only 400 students, it has an advisory program rather than guidance counselors (who go to their students' homes to meet their families), and it has a personalized learning plan
2. **Adult immersion**—students experience the adult world in a healthy way, and all juniors and seniors have intern experience
3. **Intellectual mission**—the goal of the school is technological proficiency, academic rigor, and beauty in design

The facility has student workstation suites and a flexible open-space common area that can be adapted for meetings, plays, or exhibitions.

Educational Center

Panel: Dr. Stephen Weber, President, San Diego State University
Dr. Serafin Zasueta, President, Southwestern College
Dr. Edward Brand, Superintendent, Sweetwater Union High School District

The Education Center is a joint venture of three institutions: San Diego State University, Southwestern College, and Sweetwater Union High School District. The three knew that by combining their resources they could provide better teaching and research opportunities.

Sweetwater Union is the largest district in San Diego right now, with 36,000 students and two high schools under construction, Edward Brand said. San Diego also has a large adult school program; with 41,500 students, it is the second largest such school in California.

Serafin Zasueta added that with so many multinational companies in the area, and the proliferation of maquiladoras over the border in Mexico, the need for technologically competent people continues to grow.

As San Diego's population continues surging, so too do the number of college applications, Stephen Webber said. San Diego State University is the fastest growing university in the fastest growing system in the fastest growing state in the U.S.

"This is not the first time we've partnered with other groups," said Webber. "By doing so we're overcoming the invisible lines of any urban community by making education truly accessible."

The partnership offers numerous benefits:

- Space
- Economy
- Collaboration of educational institutions
- Seamless education
- Improved retention
- Greater preparation, less remediation
- Curricular sequence

The Otay Mesa Project is the result of the collaboration. Its programmatic themes are international, bilingual, community health, social work, and political change. In addition, Southwestern College was interested in including manufacturing engineering, biotechnology, biopharmaceuticals, and computer science. It offers college outreach at high school campuses and transportation to the college campuses for classes.

Two bonds were passed to fund the project. In fact, said Zasueta, this is the only community that has voted for all bonds south of the red line. The vote shows that they value education and that project synergy is a reality.

Symbols, Forms, Materials, and Regional Aesthetics: The Sustainability of Culture and the Search for Authenticity

Panel: Thomas H. Blurock, AIA
Craig Mason, AIA
John P. Friedman, AIA

Rio Rancho High School is a 325,000-square-foot facility in Rio Rancho, N.M., with 2,400 students John Friedman said. It had a $30 million budget, funded by Intel through gifts and partnerships, and took 16 months to design and build.

The school's exterior design reflects the strong influence of pueblos and creates a sense of place through the use of this architectural tradition. On the inside it is divided into five academies: humanities, performing arts, business and technology, science, and first-year students.

Craig Mason discussed two schools in two very different locations, and how these locations influenced their designs: Whittier Elementary in Seattle and Pima Indian School in Tucson.

In Seattle there has been a reemphasis on neighborhood schools. The neighborhood where Whittier is located is Ballard, traditionally a blue collar fishing community.

It is in an urban, single family, residential neighborhood. The new school was built on the site of the old school and provides a meeting place and a playground for the neighborhood. It also adopted the traditional brick vernacular and looks toward the ship canal, a nod to the fishing tradition.

Whittier's site plan was designed to maintain the traditional street face and the landmark importance of the school. It is much softer and more curvilinear in the back. The main area uses abstracted imagery and is dubbed "The Canal." The colors are borrowed from the surrounding landscape.

There are also abstracted forms to echo the ship canal and its buildings. The school has a bay window like a gatehouse overlooking the bridge. Triangular shapes suggest bridges, and wave patterns suggest the water. Corrugated metal is used throughout, a reminder of material on the sheds that line the waterway. Whittier also has student-created tile work.

Pima, on the other hand, is on the Salt River, a rural, desert site where the biggest landmark is the Red Mountains. It reflects the traditional architecture of the region, which was composed of reeds and red clay, or saguaro and clay.

The Pima's symbol is a man in a maze, which has been abstracted into a design for the school. Other characters of legend have been depicted, and the building even peaks in the middle to echo the Red Mountains.

The school also adopted the use of reeds, cactus, and red clay in its buildings, along with the ancient construction methods and the forms of the traditional houses. It has canopies in wave patterns to commemorate the Salt River, which had flowed through the region when the tribe first settled there.

Both of these schools provide the students and the communities with a sense of pride and teaches them about the area's history, said Mason.

Tom Blurock discussed urban schools in southern California, which is seeing a great deal of Asian and Latin immigration. Older urban areas with low-income housing and greater density are the school districts' greatest challenges.

The International Elementary School in Long Beach is one of over 20 schools that was tapped as interim housing. However, the people never moved out, so the school moved into a renovated parking garage.

To mitigate the schools formerly utilitarian appearance, the designers used a lot of glazing. They also created a mural in the courtyard in celebration of writers from around the world and throughout time.

The school's roofs are now play fields to accommodate for the urban setting, while classes are on the bottom two levels. The courtyard is the gathering space. There is a green play field across the street, and the street itself is closed during school hours for the children's protection.

In that neighborhood families are constantly moving. The school offers stability for the community.

The Pueblo Elementary School in Pomona, Calif., was once a store. Its boxy shape was easy to convert. The back parking lot was transformed into playing fields, the interior was strengthened and divided into pods. The corridors are extensions of classroom space.

One theme in this school is geography. There is a large compass on the floor at ground zero, and markers throughout the school to show direction.

"Schools are a force for redevelopment of benighted areas," Blurock said. The community really wanted a market and waited three to four years for private development. Having the school there helped.

The Rio Rancho High School is an example of the community and the school district joining to build a technology-based school. Intel donated $8 billion to the school and received $240 million in tax breaks.

Rio Rancho offers all the latest technology, including fiber optic cabling and 1,000 computers for 2,400 students. Despite its strong school-to-work program and its technology focus, the arts academy remains the most popular.

Ecology, Landscape Design, and Conservation: Working with Building Systems to Generate Meaningful Spaces for Learning

Panel: Gary Keep, AIA
Stephen Bingler, AIA
Wyndol Fry, Executive Director, McKinney Independent School District

McKinney Independent School District, with over 56,000 students, is one of the fastest growing in Texas, said Wyndol Fry. The district decided to try a new prototype high-performance school—and they didn't just mean high performance academics.

Walker Elementary, with 600 students, was designed with environmental sustainability in mind. It has incorporated recyclable materials, is located near community bike and walking trails for easy access, maximizes use of winter sun light, and has solar water heating.

It also collects rainwater to weather long droughts. There are 68,000 square feet of space on the roofs to collect the water. The cisterns of galvanized metal and native stone not only store the water, they also act as focal points for the school. Also, there are windmills pumping the water between cisterns.

The landscaping around the school grounds is very natural. There is a native planting area and a water habitat with an old fashioned pump that students can try out.

The pump is only one of many aspects of the school that is both environmentally friendly and a teaching tool for the students. There are exposed building elements, like fire suppression and HVAC; there are two sundials; and there is a water gauge for the cisterns.

The Henry Ford Museum School is another environmentally friendly building that faced the challenges of limited resources and constant growth.

"We need a multipronged approach to problems that face us and our schools; we need to make long-term investments," said Stephen Bingler.

Right now, he said, we're stuck in the status quo of duplicated efforts in governance, transportation and planning, education, and growth. There are many possible solutions: smart growth, new urbanism, healthy communities. All have their pros and cons, but one of the most interesting is healthy communities, Bingler said.

In the healthy communities approach, the community is as a body with six connected organs: education, organization, cultural, social, economic, and physical.

The physical side of the project includes things like roads and bridges and energy consumption. A Los Angeles-based organization called Tree People discovered that there is a 12 to 18 percent energy savings from having trees. Its findings forced the L.A. School District to dig up all the asphalt and replant.

Cultural elements include museums and schools, and how they can be used for other purposes. A West Virginia community uses a museum to teach art, freeing class space in the schools. And in San Diego, the community uses the Cesar Chavez Elementary School for festivals.

Schools can also accommodate social life and activities. The Tenderloin School in San Francisco has a health clinic, a dental clinic, a family service center, a community kitchen, and a school. This facility thereby saves money *and* energy, and gives us a model for integration.

Education can branch out in many directions. A school in Rhode Island, which also serves as a community center, left all the streets in place and has a town square in the center, creating a seamless connection from the school to the community. The Downtown School in Minneapolis doesn't have a gym because it uses the YMCA around the corner; it doesn't have an auditorium because it uses the one across the street; and there is a joint lounge between the university education program and the high school teachers.

"The most energy-efficient building is the one we don't build," Bingler said.

The Henry Ford School took this lesson to heart. By building the school within the existing museum, they saved time and money. In fact, the cost was 25 percent that of a normal school. And, the building requires no extra electricity.

The dropout rate in Detroit is 50 percent, Bingler said. "We spend only $4,000 per year to educate but $30,000 per year to jail. It is time to do what we can to keep these kids engaged and in school; it is time to think systemically, not just per square foot."

Campus Planning and Community Design: The Impact on Our Quality of Life

Panel: Timothy J. Dufault, AIA
Alison M. Whitelaw, AIA

The complexity and interrelationships among schools and their communities should never be overlooked Alison Whitelaw said. Linkages are the essence of a sustainable approach.

Wholism is the theory that everything is related. For example, you can't sustain a community without sustaining the environment. Furthermore, it is not always easy to determine what the best choices are, especially when so many compromises are necessary.

Although strong environmental policies don't interest the current U.S. government, we still could gain leadership from industry and corporations. Many have realized the harm they once inflicted and have changed their manufacturing policies.

How are we true to our intentions, Whitelaw asked. Being passionate about sustainability is a good start, but we must know of resources and research. The mission statement at Whitelaw's firm is "Designing for our children's children's children."

She offered some examples of complexity and simplicity, beginning with the extreme simplicity and sustainability of the Anasazi cliff dwellings. Difficult access is the only drawback there.

The home of the San Diego Environmental Services Department also houses a library and training services. Its interior is completely remodeled. It was fitted with integrated systems to conserve energy. Now its energy costs are 62 percent less than are those of the twin building next door, which was not retrofitted.

The design team reused building materials and established a recycling system that required the contractor to prove that everything was either reused or recycled.

There are now low-flow water systems and waterless urinals. Filters and negative pressure on the building that blows out particles improved internal air quality.

This project also serves as a demonstration to the public, which can take a self-guided tour.

Involving the community in the design process should be a given, Timothy Dufault said. You want to create a space that meets the needs of learners, communities, and society.

We face many issues these days: genetics, global vs. local, agriculture, energy, transportation, exploration, communication, and technology, among others. We must also consider the broader issues of society, culture, and ecology.

An initiative called "New Schools Better Neighborhoods" (NSBN) was begun in Los Angeles to foster community involvement.

NSBN's (www.nsbn.org) goals include:

- Offer framework for best way to site and design schools
- Include community dialog
- Move away from the factory model
- Forge partnerships
- Change bureaucracy
- Build permanent constituency group

WMEP Interdistrict Downtown School offers a model of community partnerships. It uses nearby facilities and shares its own with other groups. It has strong ties to local businesses. It responds to the street. It has adapted numerous sustainable features like daylighting and photoelectric cells and solar walls. It also used simple materials to make maintenance as simple as possible.

The Tenderloin School in San Francisco is another excellent example of community involvement. By talking to the community and finding out what it needed, the school became a place that also served basic community needs such as health. In addition, charrettes were held to create the tile murals. Some tiles were individual efforts, others were designed together to form a larger scene.

Community involvement is worldwide. In Heinavaara Elementary School in Finland, a rural community wanted to find a way to offer more services to convince people not to move away to urban areas.

Wood is an abundant resource in Finland, and the local carpentry is phenomenal. However, the carpenters wanted to update their techniques so there was a great deal of interaction with the U.S. to learn about our framing techniques and innovative school designs. The open environment that was built in the school has brought everyone together, both the students and the community.

The Next Generation: Satellite Learning Centers, Global Teleconferencing Labs, and Public-Private Partnerships

Panel: Bruce A. Jilk, AIA
Norm Dull, AIA

There is a definite limit to the school models that we follow today said Bruce Jilk. His discussion, titled "Injunctions and Angels," explored the meaning of the Watershed Decade, a term coined by the Club of Budapest.

Injunctions can be defined as rules, while angels are the enablers of rules.

There are a variety of philosophies today, with various influences and rationales for each one. For each philosophy there is an architectural type.

Right now we are too focused on the past. It is understandable, because that is what we know. Nonetheless, it is time to envision new utopias; time to build based on a set of rules and requirements rather than following a model blindly.

The Watershed Decade is 2010-2020. This will be a critical decision time when we find new school types. By 2020-2030 the traditional school will be simply another player, and by 2030 it will become a fine grain of sand in a vast sea of choices.

The economics of the information age demand a different school. Much of what is done today comes down to branding, creativity, and clever marketing.

We are also evolving a third culture, beyond the two traditional cultures of science and language. This third culture is the language of vision. It offers an added dimension to the way we learn and view things today. It is part of the symbiotic relationship we have with technology.

Technology is also creating a fourth kind of space for us. Early in human history we had earth space, which was all about hunting. We next evolved to territorial space when we learned to farm. Commodity space arose with industry. We are now entering knowledge space, which is the stone age of the mind and the beginning of a whole new series of spaces.

Today's schools are overdesigned, concluded Jilk. Educators, planners, and architects should create only the armature of the environment. The rest should be up to the learner.

Anticipating future needs is a daunting task, said Norman Dull, and the key is to be flexible. He discussed Alpha High School in Gresham, Ore., as an example.

Alpha is an alternative school that offers individually tailored training, diverse experience in the work world, and positive self-development and aims to help students determine future careers as they earn their diplomas.

Students spend half of each day in classroom settings. They spend the other half of the day in job experience settings, be it onsite, in a business lab, or in a school-to-work program.

The school itself is in an urban setting, a block away from the train station. The 16,000-square-foot facility was designed specifically to house these programs. One of Alpha's key design mandates was that it not look like a school.

Administrators were also adamant that the facility be flexible. Teachers use mobile carts as desks rather than being confined to a single room, but most useful of all are the movable walls and furniture that allow the staff and students to adjust the rooms to their needs.

So far, Alpha High School has a very impressive record: 100 percent of the students have graduated, 97 percent are employed, there is a 95 percent attendance rate, and a 78 percent retention rate.

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Tours

Tour 1: Rancho del Rey Middle School, Chula Vista, Calif.
Martinez + Cutri

The middle school, which cost $157/square foot, is divided into seven houses, with 240 students per house and 32 students per class. The layout of the campus is terraced. There is a PE building, an amphitheater, and a multipurpose room in addition to the seven houses.

Over a six-month period, the Project Task Force (made up of teachers, staff, and parents) determined five principles that shaped the school's programming and layout:

- An interdisciplinary approach to education
- A focus on technology, communication, ecology, and the global community
- Development of social skills, such as a positive work ethic and civil responsibility
- Empowerment of students through mentoring, community service, etc.
- Success in the future through creativity, technology, team work, problem solving, etc.

Within each cluster there are eight classrooms that foster a "thinking curriculum." In each cluster there are a pair of "smart classrooms," which contain computer and A/V capabilities. Then there are a pair of "flex classrooms," where seating can vary from seminar to individual tutorial, to conference seating. A third pair of classrooms, "adjoining classrooms," can be used with the flex classrooms and/or the "portfolio project classrooms." The portfolio classrooms have a roll-up wall for indoor and outdoor learning opportunities.

Image courtesy of Martinez + Cutri

Tour 2: Cesar Chavez Elementary School
Martinez + Cutri

The elementary school, located on a 7.9-acre site in a predominantly Hispanic community, has 600 students in its K-6 program. It has 18 permanent classrooms, four portable classrooms, administration, a library-media center, a multi-purpose room with a kitchen, an outdoor lunch court, and recreation areas.

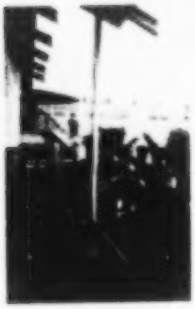
One of the most interesting aspects of Cesar Chavez is its community-inspired design, derived from 5,000 years of oral storytelling tradition by the indigenous people of the Americas.

At the center of the campus is the academic plaza, defined by a 350-foot "Cosmic Indian" dressed in the cultural milestones of the Americas. The eastern façade of the library is patterned after Central American pyramids. The main façade of the library depicts the logo of the United Farm Workers. The faculty lounge façade is a Quetzal Indian Headdress.

Image courtesy of Martinez + Cutri

Tour 3: Garfield Continuing High School
HMC Group

This 68,0000-square-foot, $15.6 million educational facility is a joint venture between San Diego Unified School District and the San Diego Community College District.



Garfield, an alternative high school and the only vertical school in the district, is a five-story structure designed in a u-shape to create a central courtyard and to provide views of the San Diego bay. The u-shape also simplifies security by keeping all circulation to the interior.

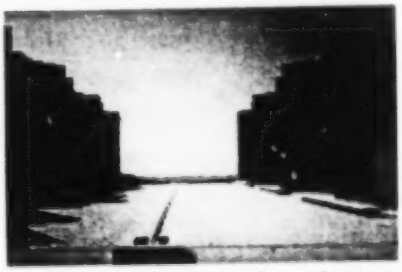
The community college district provided the site, and its students are able to take night classes there. In addition, the high school's 50-year lease payment for the land was balanced by building the parking garage.

There is a special program, with a separate entrance for pregnant minors. And, there are strong ties to the business community to help train these students and ensure a smooth transition to the working world when they have graduated.

Optional Tours

The Salk Institute, La Jolla, Calif., Louis Kahn
The Neuro Science Institute, La Jolla, Calif., Todd Williams Billie Tsien & Associates

The Jonas Salk Institute for Biological Studies in La Jolla, Calif., was designed by Louis I. Kahn to house a community of scientists involved in concentrated research. He took as his inspiration monasteries or other forms of intellectual retreat.



The laboratories are separated by a concrete piazza and a water garden, and they form a framed view of the Pacific Ocean. The buildings themselves are large free-plan spaces that can be readapted easily for different experiments.

The Neurosciences Institute was designed by Todd Williams Billie Tsien & Associates as a "monastery of science." It is a theoretical and clinical research campus for the study of the brain.

The program comprises three elements: the Theory Center, the Laboratories, and the Scientific Auditorium. These three buildings are arranged around a central plaza.

While preserving views of the Santa Rosa Mountains to the east from the top of the ridge, the sloping site was developed to keep the buildings low and firmly engaged in the land. Inclined walkways connect the plaza level to the terrace, which, incorporating the roof of the Laboratories, provides access to adjacent sites and through an existing tunnel to The Scripps Research Institute campus across North Torrey Pines Road.